

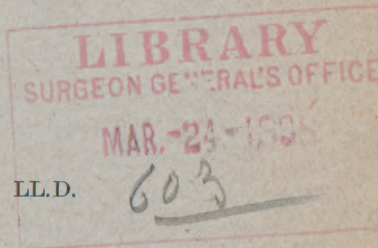
MARCY (H. O.)

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# Intestinal Obstruction after Laparotomy.

Read in the Section on Obstetrics and Diseases of Women at the Forty-seventh Annual Meeting of the American Medical Association, held at Atlanta, Ga., May 5-8, 1896.

BY HENRY O. MARCY, M.D., LL.D.  
BOSTON, MASS.



*presented by the author*

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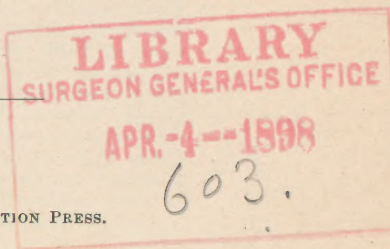
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## INTESTINAL OBSTRUCTION AFTER LAPAROTOMY.

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The internal hernia, so-called by the early authors, possesses an entirely new and increased interest, since intestinal obstruction occurs more frequently than formerly, as a sequel to the surgical invasion of the abdominal cavity. I believe also that this is a far more common cause of death than usually supposed, since the success attending the surgery of the abdomen has emboldened many surgeons to undertake a great variety of operations, considered unwarranted a decade ago.

Before entering into any general discussion of the subject, it has seemed instructive to give a brief report of all the cases of intestinal obstruction following laparotomy, which have come under my observation.

*Case 1.*—Mrs. C., aged 31, married, has three children. April 14, 1890, I removed a dermoid cyst of the left ovary weighing eight pounds. Right ovary size of an egg, capsule thick and friable. Peritoneum covering pedicle parted easily under constriction of the suture. Marked nausea after etherization. The stump was touched with liquid carbolic acid and covered with iodoform. The uncovered peritoneum was scarcely larger than a split pea. Convalescence comfortable, with primary union of the abdominal wound, which was closed without drainage. Bowels moved the third day; kept open by saline laxatives. On the seventeenth day symptoms of intestinal obstruction supervened, with nausea and vomiting, slowly becoming more pronounced. On the twenty-second day it was evident that grave danger was imminent, every effort to evacuate the bowels having proved futile. Assisted by the late Dr. Trenholme of Montreal, I reopened the abdomen and found two loops of the lower portion of the small intestine firmly adherent to the stump of the right ovary. The adhesions were separated with difficulty. The intestines were not very much exposed, and yet the shock was very pronounced and for some hours danger of death seemed imminent. Convalescence was slow but satisfactory. The patient remains well up to the present, entirely free from abdominal pain.

*Case 2.*—Mrs. L., aged 35, married, has borne children. General health fair. On July 13, 1892, I performed vaginal hysterectomy for cancer. Operation less difficult than usual. The broad ligaments were constricted by clamps which were removed the second day. The third day nausea and vomiting supervened, rapid elevation of temperature and death occurred on the fifth day from intestinal obstruction, not clearly recognized until autopsy, since it was believed that septic peritonitis was in process of development. On examination it was found that a loop of the lower portion of the small intestine was adherent to the stump of the right broad ligament, but the lymph adhesion was easily separated. The intestine above was filled with a large quantity of dark-colored fetid fluid, and it is believed that the symptoms of septic poisoning came from the absorption of the products of decomposition of this fluid. There was no peritonitis and the pelvic wound was uninfected. The adhesions could have been easily freed by an abdominal section.

*Case 3.*—Mrs. C., aged 42. General health fairly good, although she had suffered long from pelvic troubles. Two years previous I had removed the right ovary, which was cystic, resulting in an adherent tumor cocoanut size. Recovery was rapid and uneventful. For six months prior to the second operation a cystic tumor of the left ovary had developed until it reached a point above the navel. Operation Nov. 28, 1892, Dr. James R. Chadwick present. The omentum was found somewhat adherent on the line of the old cicatrix. The tumor was removed with difficulty, owing to its being bound down by adhesions. Recovery from the operation was not satisfactory, shock pronounced and nausea persistent from the first. All the symptoms became slowly more aggravated, until at the end of the third day it was apparent that intestinal obstruction was threatening the life of the patient. Upon re-opening the abdomen a loop of small intestine was found constricted by an old omental band of adhesions upon the left side, just above the brim of the pelvis. It is very probable that the intestine became entangled at the time of operation. It was easily freed and the operation was completed in a short time, but the shock following was very pronounced, the patient never rallying from it, and death supervened in a few hours.

*Case 4.*—Mrs. G., aged 52. General health good. She had suffered severely from a rather rapidly growing multiple uterine myoma, which was impacted in the pelvic cavity and extended to the umbilicus. Operation Oct. 24, 1895, assisted by Drs. H. D. Didama, Syracuse, and D. T. Nelson, Chicago. The operation was not difficult, the most noteworthy feature being that a small firm lobe of the tumor was so fixed to the right lower vaginal cul-de-sac that upon removal the adjacent peritoneum, although not bleeding, was dotted with minute red points. At the time of operation it was remarked that such a condition of



the pelvic peritoneum would favor intestinal adhesions. The tumor was dissected to the cervical neck, resected and the arteries separately ligated and the peritoneum intra-folded by a running continuous buried tendon suture which left no abraded peritoneum other than the portion already described. It was deemed unwise to drain the depressed portion through the vaginal canal and for better protection it was covered freely with sterilized aristol. There was considerable shock following the operation, but the patient rallied well and for forty-eight hours gave every promise of easy recovery. Nausea and vomiting then ensued with elevation of temperature and abdominal distension. Intestinal obstruction was recognized, but the danger was not thought sufficiently imminent to warrant surgical interference, until suddenly the condition became too grave to render the procedure, even as a forlorn hope, advisable. Death occurred about seventy-five hours after the operation. Nausea and vomiting persisted to the end. Six hours before death the temperature began to rise from about 101 degrees until at death it had reached 107 degrees. Autopsy showed adhesion of the lower part of the small intestine to the punctated portion of the peritoneum. It was readily separated. The intestine about the point of adhesion was greatly distended by a large quantity of dark-colored fluid, evidently having undergone decomposition prior to death. The line of union of the intra-folded peritoneum was perfect. There had been no pelvic serous exudation and no septic infection.

*Case 5.*—Miss S., aged 44. Operation performed Nov. 30, 1895, for removal of a large adherent uterine myoma, assisted by Dr. Nelson of Chicago, Dr. Cilley of Boston, and Dr. Berrymore of St. Johns, N. B. The operation was long and tedious, followed by pronounced shock. Rallied well and on the second day the conditions seemed favorable for recovery. Nausea and vomiting commenced about thirty-six hours after the operation. Not very pronounced until twelve hours later, when it was evident that intestinal obstruction had supervened. I reopened the abdomen and found a loop of the lower part of the small intestine involved in adhesion of the omentum, situated in the right iliac region. The small intestines were greatly distended by gas and fluid, and were manipulated with some difficulty. At the time of the operation temperature was 101; immediately following the operation there was a large fluid defection. Within an hour it was noted that she was in profound shock, from which she never rallied, death occurring some hours later. The most noteworthy feature was the elevation of temperature, which rose steadily about a degree an hour, reaching 107 degrees before death. I twice used an intravenous injection of saline solution, each time introducing nearly a pint. The flagging heart immediately responded, giving a comparatively slow, full, compressible pulse. The effect, however,

soon subsided, notwithstanding the use of digitalis, strychnin and nitro-glycerin, used freely hypodermically.

*Case 6.*—Mrs. K., aged 34, never pregnant, married eight years, advanced cancer of the cervix from which she had suffered severely in her general health. Vaginal hysterectomy Dec. 7, 1895, assisted by Dr. C. E. Miles of Boston. Operation difficult, owing to a long narrow vagina and the extent of the disease. I sutured the broad ligaments and introduced gauze drainage. Convalescence seemed well established the tenth day, when symptoms of intestinal obstruction supervened. Upon opening the abdomen a loop of the lower portion of the small intestine was found incarcerated by an old band of adhesions which crossed the pelvis in the region of the right ovary. This was easily divided and the intestine freed. The abdominal wound was closed without drainage. Fecal evacuations soon followed with speedy relief. The shock following the operation was pronounced, but the convalescence was uneventful. The patient is well at the time of writing.

*Case 7.*—Mrs. D., aged 42. Very nervous organization, but in fair general vigor, although a severe sufferer for some years from a retroverted, adherent, enlarged uterus, cystic ovaries and diseased tubes. The bowel had been freely evacuated, only fluid food in small quantities often repeated given for some days before the operation, with as large quantities of water as could be easily taken. Operation March 18, 1896. It was difficult, owing to the imbedding of the diseased adnexa in the pelvic cavity. After the removal of the diseased structures, the enlarged, retroverted uterus was brought forward and sutured upon each side to the abdominal wall. The pelvic peritoneum was reformed by lines of buried tendon sutures, leaving only a small portion of the fundus of the uterus uncovered, which was partially denuded of its peritoneum, owing to old adhesions. The small intestines were covered by the omentum with great care, the fundus of the uterus dusted with sterilized aristol and a vaginal drain of iodoform gauze carried through the posterior cul de-sac into the vagina. Patient rallied well from ether. The night following the operation was comfortable. Nausea and vomiting ensued on the morning of the 19th, with a singular weakening of the heart's action, followed by rapid elevation of temperature, reaching before death 107 degrees. The skin was mottled with dusky patches some hours prior to death. These conditions were believed to be due to intestinal obstruction. The gauze drain was withdrawn and an effort made to examine the pelvis through the opening, but without avail. The general condition forbade reopening the abdomen. Regardless of every effort the patient died about forty hours after the operation. The autopsy showed a loop of the lower part of the small intestine attached to the fundus of the uterus, which was separated with the greatest ease. The intestine above was filled with several pints of a



very fetid, dark-colored fluid believed to have undergone decomposition prior to death.

The cases reported were all operated on under the most favorable of hospital appointments and with the very best of attendant care.

I purpose to confine myself to the salient points offered in a review of the cases just reported.

*Anatomic Relationship.*—It will be noted that the portion of the intestine involved in the obstruction in each case was the lower part of the ileum, and that the obstruction was caused either by an adhesion of the intestine to an abraded peritoneal surface, or by a constriction.

Owing to the erroneous teaching of a leading English authority, it has been too generally accepted that, in the normal condition, the small intestines do not descend sufficiently to enter the pelvic basin. Since it was found that more commonly the portion of the intestines strangulated in inguinal hernia was a loop of the small intestine, this author ingeniously advanced the theory that the hernia itself was due to the elongation of the mesentery, causing the dislocation of the intestinal loops, rather than to a previous weakness of the abdominal wall. The measurements made by this distinguished anatomist seemed to show that the distance from the root of the mesentery to the intestinal loops was so short that only by dragging upon them could they be pulled down sufficiently to enter the pelvic basin. I do not doubt the correctness of his observations, but it must be remembered that the postmortem rigidity and fixation of the parts furnish conditions quite different from those found during life. My studies of hernia early led me to a consideration of this subject, and my observations, based upon the examinations made in about a thousand laparotomies furnish abundant proof that the small intestines, the ileum especially, in its normal range of motion includes a juxtaposition of the pelvic structures and organs.

Here the intestines are less protected by the omen-

tum which intervenes between them and the abdominal wall, where the omentum is interposed, and it is a question by no means settled satisfactorily, if normally the omentum lies between the basic folds of the small intestine and the pelvic structures. It probably does not and so gives easy explanation why portions of abraded pelvic peritoneum are especially liable to offer points of attachments to the superincumbent intestinal folds.

A study of the large intestines shows ample reason why obstruction does not usually occur in this portion of the intestinal tract. That part within the pelvis, and which may be more or less involved by surgical manipulation, is within easy range of digital and instrumental examination, and the solution of any complications is easily determined. Ascending above the pelvis, the remaining portion of the large intestine, because of its position, construction and relationship, only very rarely can become involved in intestinal obstruction, and as a consequence may usually be excluded in the differential diagnosis.

The mooring of the cecum is generally sufficiently fixed to preserve its relationship unimpaired, but pathologic conditions arising from the appendix are much more common causes of intestinal obstruction than was earlier supposed. Adhesive bands frequently extend to the surrounding parts, which may become causes of intestinal obstruction by producing constriction of an incarcerated loop. In one instance of intestinal obstruction, I found an abnormally long appendix encircling the small intestine near its junction, and fixed by inflammatory adhesions. This had caused a slowly developing intestinal obstruction, which had been complete for some days ending in fecal vomiting before operation. Elsewhere the intestinal canal was normal.

In three of the cases here reported, two fatal, it will be observed that intestinal obstruction occurred from incarceration of the lower portion of the small intestine, caused by adhesive bands of old forma-

tion. In the two fatal cases a laparotomy had been performed some years previous and, although both were nonsuppurative cases, adhesions had formed, probably caused by undue pressure of opposing peritoneal surfaces, owing to pathologic conditions. When, as in these cases, the omentum becomes the offending structure, I know of no anatomic guides that will lead us to the part involved. Hence, the surgeon must examine carefully a wide area, without special direction except the guidance taught by the individual history.

*Diagnosis.*—The foregoing histories teach a wide difference in the severity of symptoms from that of intestinal obstruction as usually observed in volvulus, or strangulation resulting from hernia. Here, even in volvulus, in umbilical and femoral hernia, where the symptoms are the most acute, a considerable longer period ensues before the patient is *in extremis*. In the last case reported, death occurred before it seemed possible for a fatal issue to follow from an arrest of the intestinal fluids, where also the greatest care had been exercised in emptying the intestinal tract, and preventing fermentation by use of salol, etc.

In none of the fatal cases reported, was the integrity of the intestine endangered, and it is not to this we look for the cause of death, as has usually been considered the greater danger in cases of constriction of the bowel in hernia.

To what then are we to attribute the cause of death? May it not be, in the first instance, the operation which has so lowered the vital processes, which hold their sway over the living structures, as to admit changes to ensue which otherwise would not occur? These vitiating processes are rapidly augmented by the fermentative changes which occur in the superincumbent intestinal contents. These fluids are not extraneous, that is to say, only in very small part consisting of the ingesta, but are made up largely of the albuminoid secretions, vitiated products of the glands,



together with the fluids poured out by the obstructed blood circulation. The chemic products resulting from this decomposition are crystallin and in solution easily reënter the blood current, producing a septic infection of the most virulent character.

Changes in the hepatic structures occur early and the devitalization of the tissues, at first pronounced, go on *pari passu* in geometric ratio until the individual is destroyed by acute blood poisoning, rendered far more rapid from its initiation having commenced under such unfavorable circumstances. Peristalsis of the intestine lessens at an early period because of a reflex paralysis of the local inhibitory nerve centers and, as a consequence the opposing peritoneal surfaces remain more nearly at rest, and at the point of injury the effused lymph rapidly becomes organized. Nausea, vomiting, diminution and arrest of peristalsis, abdominal distention, accompanied by general constitutional depression, with increasing thirst dependent upon lack of absorption are among the earlier symptoms. Possibly local pain, which however, in my cases has been absent, may point to the site of adhesion. A marked elevation of temperature is relatively not an early symptom. The nervous centers are disturbed by an indefinite anxious foreboding, the pulse becomes accelerated, respiration often shallow and rapid. The latter is probably due to an interference with the action of the diaphragm. These symptoms may be complicated by a general peritonitis, and have without doubt often been mistaken for it. However, a careful analysis of symptoms will generally enable the observer to make an accurate, differential diagnosis.

*Prevention.*—Although in not more than one per cent. of laparotomies, does intestinal obstruction occur, and in my own experience the percentage is about one-half less than this, when it does take place the complication is so severe, and the fatality so great that the fear of intestinal obstruction may well be considered the nightmare of the abdominal surgeon.

Therefore it is of the utmost importance that every precaution possible should be taken to prevent its occurrence. Believing that its causation depends in a large degree on the abrasion of the peritoneal surfaces about the site of the operative field, one of the first queries that arise is, how may this be lessened or avoided? It was for this very purpose, that years ago I introduced to the profession various methods of plastic surgery of the intra-abdominal and pelvic structures. These I constantly practice and enthusiastically advocate in order to restore all injuries of the peritoneum.

In the removal of tumors I cover with the greatest care, the healthy peritoneum over their pedunculated attachments. Where, for any reason, it is necessary to remove the uterus, for a long period I have divided the tissues in such a way that the cervical stump can be carefully closed over by the double intra-folding of its peritoneal investment. This I do by the use of the parallel running suture, the stitches taken in such a way that when drawn upon, the suture itself is completely buried, and the peritoneum lies in easy, accurate approximation without tension. If a ureter is laid bare, the peritoneum is covered over in the same manner.

In the removal of the appendix, the stump is always covered and peritoneal abrasions are intra-folded where the integrity of the same has seemed doubtful. In some instances I have even closed the entire peritoneum across the brim of the pelvis, at its basic attachment, to the floor of the bladder, thus completely obliterating it. By these measures, in this class of difficult cases I have found it possible to attain another very desirable end, that of closing the abdominal wound without drainage.

Here also, for many years, I have taken the precaution to approximate the abdominal peritoneum with the same care, in order to prevent adhesions of the omentum to the line of the wound, and with most excellent results. Since 1892 there has occurred in

my experience the three cases above reported where death has taken place from peritoneal adhesions. In the first, a case of vaginal hysterectomy, it was thought wise to use clamps which left uncovered the divided peritoneum of the broad ligament. However, in a majority of vaginal hysterectomies by careful manipulation it is possible to suture across the everted peritoneum. When this can not be effected, the raw surfaces can usually be protected by gauze. It may however, happen as in Case 5, that pathologic changes have ensued at some previous period, leaving resulting inflammatory bands. I know of no way to provide against such complications, unless it may be in doubtful cases to open the abdomen from above also, in order to deal intelligently with existing conditions.

In Cases 4 and 7, at the time of operation, doubts were entertained as to the method to be selected. In Case 4, where the pelvic peritoneum seemed scarcely abraded, the results show that it would have been wiser to have adopted one of two alternatives. A vaginal opening might have been made and the parts protected by iodoform gauze, or the depressed portion of the peritoneum have been sutured across at its upper part. It is probable this would have been the better of the measures to have adopted, since it would have added very little to the traumatism and taken less time than the opening of the vagina and the introduction of the vaginal drain. It was, however, covered with a thick layer of aristol, which I can not doubt would prove ample protection in the majority of instances.

In Case 7, the uterus should have been removed. The organ had long been bound down by adhesions which were separated with difficulty. The protection, however, seemed ample, by the free introduction of iodoform gauze which was so packed about as to cover the denuded peritoneum. The point of adhesion was very near the fundus of the uterus where the gauze had become displaced. I can not question the wisdom of removing the uterus in many cases where,



until a very recent period, such a procedure would have been considered unsurgical. It adds comparatively little to the difficulties or severity of the operation and permits the covering in of the pelvic peritoneum in an even fold, from side to side, entirely across the pelvis.

*The omentum.*—Where for any reason the omentum has been involved in the pathologic changes, it becomes very important to examine it carefully, and if rents have occurred to close them. This is best effected with a continuous tendon suture. It should then be replaced with the greatest care, and if any points of abrasion appear they should be well dusted with aristol.

Cases 3 and 6 are instructive; Case 3 where it seems very probable that a more careful observation should have been made and the attachment of the omentum to the anterior abdominal wall, resulting from a former operation, should have been separated. In Case 6, it seems as if every precaution had been taken to prevent such an occurrence. The omentum which had been carried up to the region of the liver by the large myoma was somewhat changed in its structure. The parietal peritoneum had long remained in direct contact with the myoma and by friction was also changed in structure. The omentum was spread out evenly over the intestines and brought well down to the brim of the pelvis. There was no bleeding from the separated points of attachment, and the pelvic organs were carefully cared for by the plastic repair of the peritoneum. This had been lacerated in various directions, and the left ureter was exposed for several inches. No points of attachment to the pelvis were found, the effused lymph leaving them smooth and unadherent. The abdominal peritoneum was also intact. The constriction was well down on the right side at the brim of the pelvis and was easily freed.

It is not supposed that any better measures for the prevention of intestinal obstruction could have been instituted and the resulting adhesion of the omentum

to the side forming the band was probably the more easily induced, owing to the changed conditions resulting from the long pressure of the tumor.

*Treatment.*—The object of this paper and the analysis of this series of cases is a practical deduction as to what may be done when this most grave of all complications in abdominal surgery occurs. This is the more important, since authors are singularly at variance and apparently without definite reasons as to the selection of the means to be employed. Unfortunately, medicines, in the hands of all, fail to be of much value, except so far as hypodermic medication may control pain and perhaps materially aid the great motor nerve system.

It is evident that the entire alimentary tract above the point of constriction becomes early paralyzed and incapacitated to do more than permit the absorption of crystallin substances in solution.

It may be doubtful if our efforts to stimulate peristalsis, even if successful, do not hasten the fatal issue, unless they are equal to the forcible separation of the intestine at its point of occlusion. If this supervene a happy issue will be attained and prompt relief afforded. This is often seen in the unfolding of a displaced intestine with the disappearance of all untoward symptoms.

One of the most extraordinary of the conditions which supervene in intestinal obstruction is the rapid accumulation of fluid above the occluded part, and, although the thirst is usually excessive, the absorption even of water from the stomach does not take place, and it is probably a positive detriment to add to the rapidly accumulating fluid by even the administration of water. Vomiting certainly does harm unless by the forcible strain the adherent parts may be separated. This rarely happens, and in case a loop of intestine is incarcerated must add to the mechanical impedimenta.

If then we are deprived of the administration of medicines by the stomach, and if thus given, they are

to the detriment of the patient, what remains at our command as a means of relief? Since fecal evacuation is the desired end to be accomplished, experience in other conditions would teach that injections and medicamenta, applied to the lower bowel, might be of service. The foregoing discussion of the anatomic construction of the large bowel teaches us why we would not expect the constriction to occur in this part of the alimentary canal, unless, indeed, in rare instances the pelvic portion of the canal is involved as the result of our surgical interference. If this has happened, rectal examination will determine the fact and probably enable us to deal easily with the occlusion. Other than this, the benefit to be derived from large injections, even if they penetrated to the transverse colon, is exceedingly doubtful. The still further distension of the abdominal cavity is certainly to be deprecated, the pain and discomfort of the patient tend to weakness, and the reflexive stimulation of the peristalsis of the small intestine thus aroused induces nausea and vomiting, which is an injury unless it may, in itself, be sufficient to free the obstruction.

If, as happens in a majority of cases, the portion of the alimentary tract involved is the lower part of the small intestine, then we may determine why our efforts, applied to the large intestine are so utterly futile and the result only a loss of time and exhaustion of the patient.

It is the more important to consider these probabilities, since one of the primary rules laid down for the treatment of intestinal obstruction is the use of large enemata, variously medicated. That sufficiently careful consideration has not been given to this phase of the subject, that the obstruction does not lie in the large intestine except by the rarest of accidents, I cite the recent experience of a prominent English authority who, after using enemata freely without relief, made an artificial anus above the sigmoid flexure only to permit an easy escape of the injected fluid.



It is needless to remark the patient died unrelieved of the obstruction.

If summoned to the relief of the sufferer in such desperate cases, what shall be advised? Certainly not to do harm if we can do no good. Assuming that, prior to the operation, we know that the alimentary canal had been properly emptied so that, at the time of operation, the bowel was in the best possible condition to bear its necessary manipulation, then it is clearly our duty to keep the stomach empty. It seems to be equally important to desist from the common practice of fretting and exhausting the patient by large, repeated rectal enemata. It is true that a certain amount of water may be absorbed which the system very much needs, but that can be accomplished by much less violent measures. Hypodermic medication of morphia is of value, but this is better given in small doses, often repeated. More recently this valuable remedy has been decried under the belief that it caused an interference of peristalsis, even to the producing of intestinal paralysis. It is indeed strange if opium which has been relied upon for generations as the remedy of greatest value in nearly all the intestinal diseases can now be considered by any as the cause of obstruction and its administration criminal. Its use should be minimized to the moderate relief of pain.

Strychnia, digitalis, nitroglycerin are remedies, to be used hypodermically, of much value in holding in conservation the rapidly ebbing vital force. Nature's own powers are not to be held in too light esteem, since in the most desperate of conditions she triumphs occasionally. Of this we were never so fully aware as at the present, since the laparotomist is often called upon to examine the battle ground of previous victories, as he studies the results, where intestines have been banded to each other and the neighboring parts, and yet, within limitations, able to perform their functions for an indefinite period.

Although, as in the operation for appendicitis, it

may be in the minority of cases that the aid of the surgeon is justly called to attempt to restore the damages incident upon his previous work, a considerable class of these cases doubtless exist, and when to re-operate is a question that may never be settled. When the weight of evidence points clearly not alone to obstruction as the impending danger, but that nature is powerless to remedy it, there can be but one rule, as in strangulated hernia, operate at the earliest possible moment for the relief of the incarcerated organ. A reopening of the abdomen within two or three days after the primal operation must ever be considered a formidable surgical measure, not alone in that the patient is necessarily in a serious condition from the previous operation, but that these conditions have become greatly intensified owing to the constriction in the alimentary canal. It is important to first wash out the stomach by means of the stomach tube. Often a large quantity of fluid will pour out with much advantage in the subsequent result. This I have done at times for years. Our previous knowledge of the intra-abdominal conditions is of the greatest value. We must keep in mind the portion of the intestine probably involved, and the location where we are likely to find it. This usually is the small intestine, generally the ileum, and the location the site of the surgical operation. Since this is more commonly the pelvic basin it is the first location to be explored. The second is in the neighborhood of the appendix. These having failed to furnish results, we are to examine carefully the omentum and its relation to the small intestine. A careful observation of these factors in the order proposed is of the utmost value. Nothing is more to be deprecated than the aimless searching in the abdominal cavity, and the evisceration of the patient by the rolling out of the distended intestine, as is often practiced in the blind search for the constriction.

The inflated intestines are ever protruding, but as far as possible are to be avoided, since the infla-

tion itself teaches that this can not be the part involved. On the contrary, a portion of the intestine that is empty and flat is likely to lead almost at once to the constricted part. Here as elsewhere intimate anatomic knowledge of the abdominal cavity and its contents is of the utmost practical importance.

Etherization should be minimized. My experience with oxygen gas leads me to think favorably of it as an adjunct to chloroform. The operation should be undertaken under as favorable circumstances as possible, conducted with coolness, deliberation and dispatch, since the resources of the surgeon are rarely more severely taxed than in this dilemma.

Owing to the severe shock incident to an operation as above described, it has been recommended and practiced to make a small opening in the abdomen and through this withdraw the first inflated fold of small intestine that presents, suture it to the peritoneum and open. This gives temporary relief, permitting the escape of the pent-up toxic elements and affords time for the patient to rally from the extreme depression incident to the obstruction. As soon after as the general condition will permit, a third operation is undertaken for the relief of the constriction, at which time operative measures for the cure of the artificial anus are also instituted. In a dilemma of severe complications there may be conditions that would cause such a temporary operation to be favorably considered, and it is well for the surgeon to keep in mind the possibility of its advantage.

In review, I am constrained to add emphasis to the practical importance of the preparation of all patients for laparotomy. The condition of the nervous system is important. The lowering of the nervous tension is a very great gain. The substitution of hope for fear, and confidence in the outcome is of much more value than I earlier believed; and why should not this be true, since the best definition of life itself is the equilibrium of the vital processes in their sway over the organic matter which they hold in control?



The intestinal canal should be carefully emptied and peristalsis kept active at the time of operation. It is better to employ only fluid food for some days prior, and antiseptics, such as small doses of calomel and salol, I believe to be of value. Time is an important factor in the operation, but this is no excuse for undue haste or inaccuracy of work.

Intraperitoneal surgery must ever be of the highest order, and accuracy and completeness of detail must go hand in hand in every process to prevent infection. When these great surgical laws have been complied with recovery is in direct ratio with the minimizing of the devitalization of the patient. These are the almost ideal results which modern surgery has attained and upon their practical application depends the marvelous success of the surgeon of to-day.







